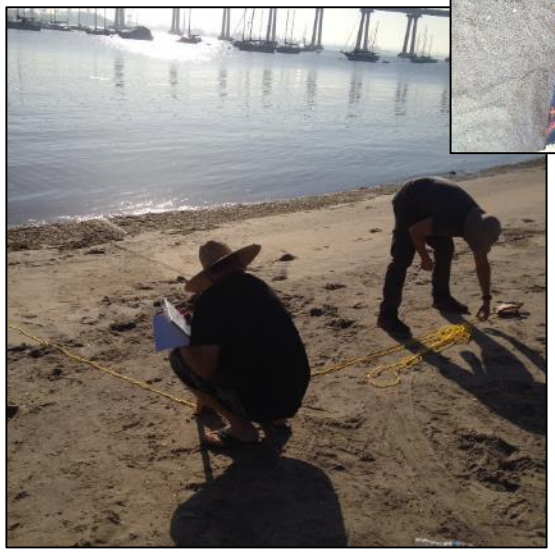
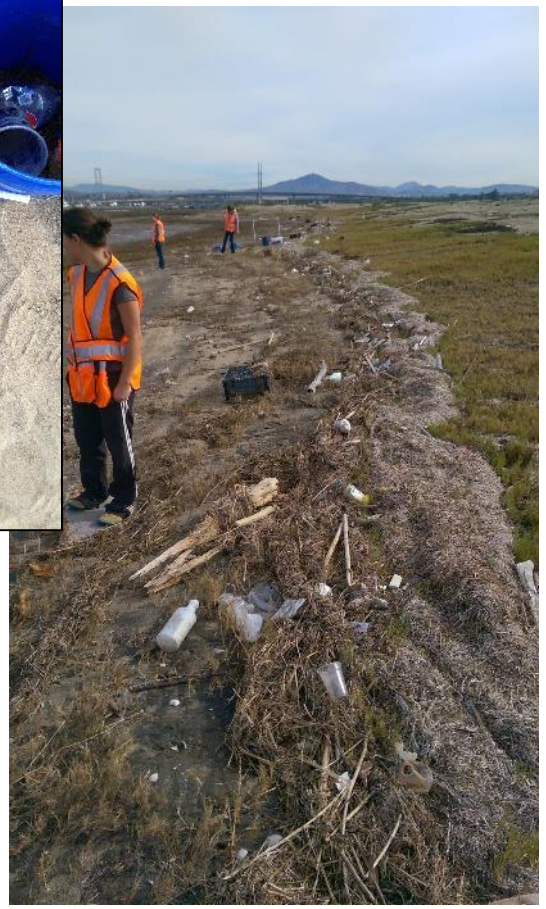
San Diego Bay Debris Study

Presentation on Trash Receiving Water Monitoring

October 18, 2017

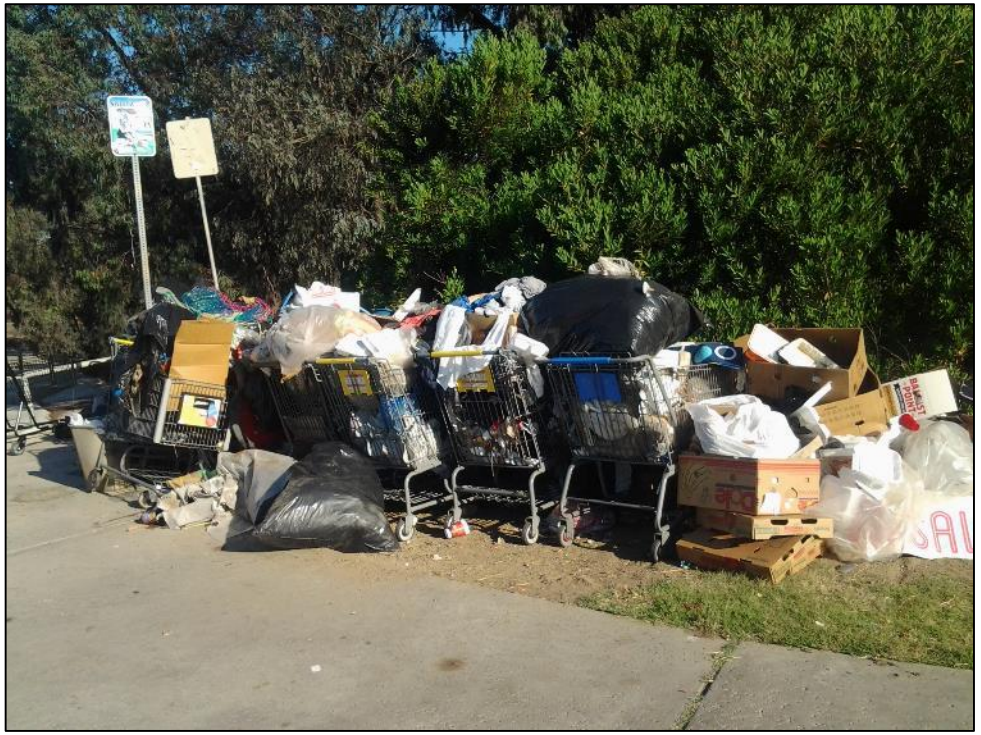
Terra Miller-Cassman, Staff Scientist
Amec Foster Wheeler





Presentation Outline

1) Project Review
2) Results
3) Lessons Learned



Study Goals

- Complete first comprehensive survey of bay and watershed receiving waters
  - (Apr 2014 to Oct 2016)
- Establish a baseline to assess against future changes
- Assist municipalities in prioritizing locations for future trash controls

Stakeholder Workgroup

Technical Advisors

Dr. Sherry Lippiatt
California Regional Coordinator at
NOAA Marine Debris Program

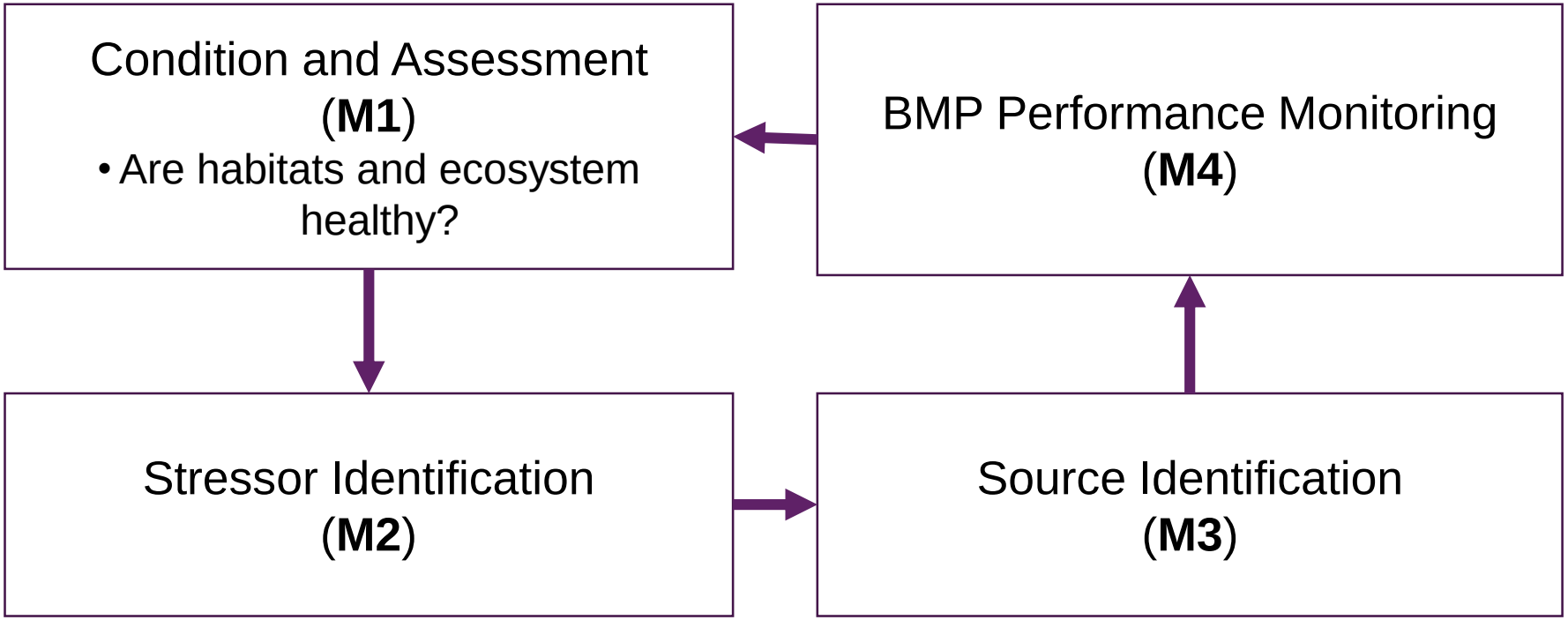
Dr. Brock Bernstein
Independent Consultant
Program Design and Evaluation

Shelly Moore, M.S.
Bight '13 Marine Debris
Lead Scientist

Study Implementation Framework

San Diego Regional Board, Practical Vision 2013

Water-Body Oriented Monitoring and Assessment Metrics (M)



Study Questions

1) *(Status)* ***How do the quantities and types of debris in different habitats vary during dry and wet season?***

2) *(Transport)* ***What types of riverine debris do wet weather flows transport to the bay?***

3) *(Fate)* ***What species caught in the bay has ingested plastic pieces?***

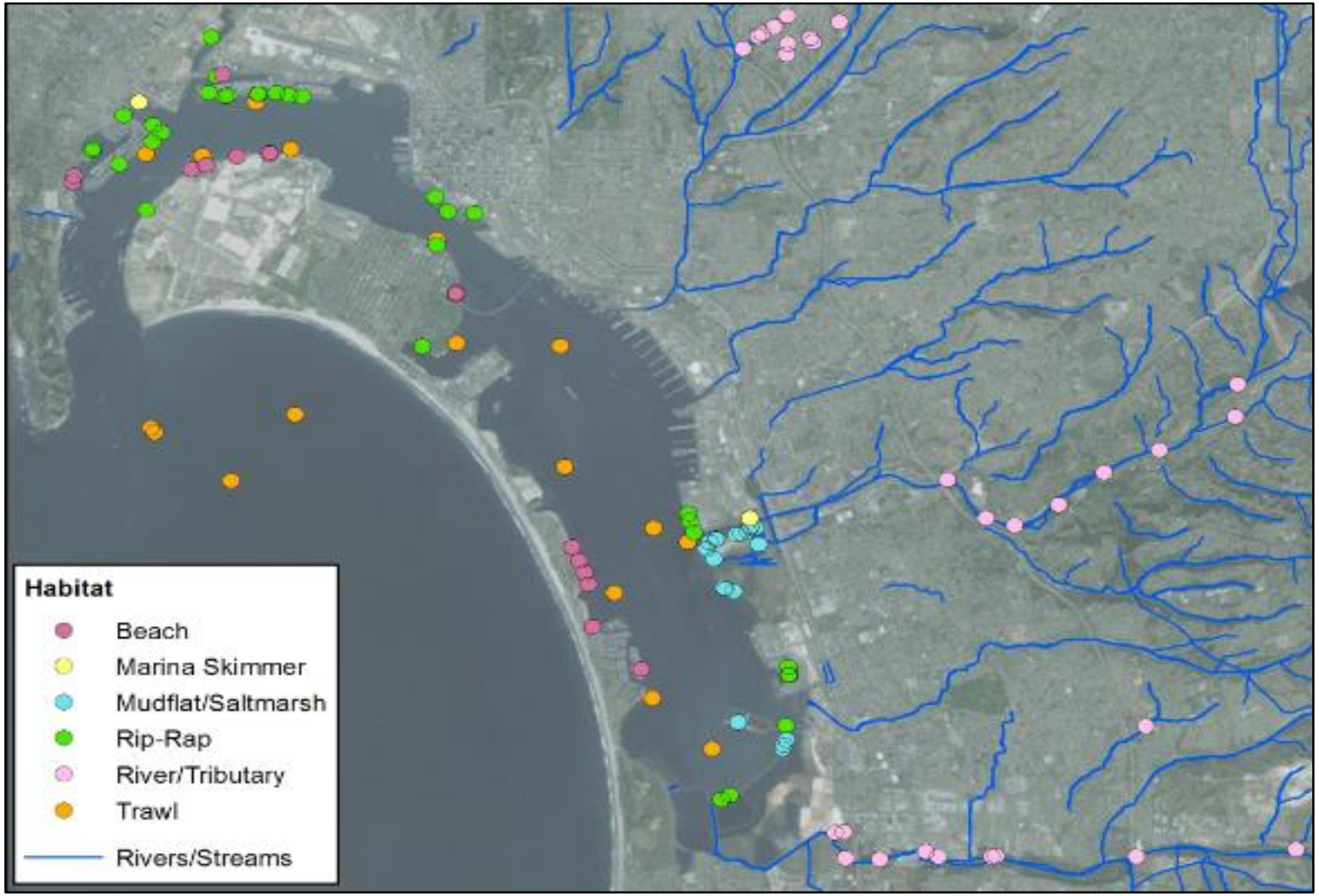
Study Design

- Probabilistic and targeted based sites within key habitats of interest
- Pre- and post-storm surveys in open water, intertidal, and riverine habitats
- Continuous collection in bay to record seasonal variations

Methods

- Standard methods from:
  - (Riverine) SWAMP Rapid Trash Assessment
  - (Shoreline) NOAA Marine Debris Program
  - (Marina) Automated trash skimmers
  - (Open Water) So Cal Bight Program Trawls
- Trash type (e.g. plastic bags), count, and volume
- Debris sizes
  - macro-plastics(>25 cm),
  - meso-plastic (25 cm – 5 mm),
  - micro-plastic (5 mm – 0.35 mm)

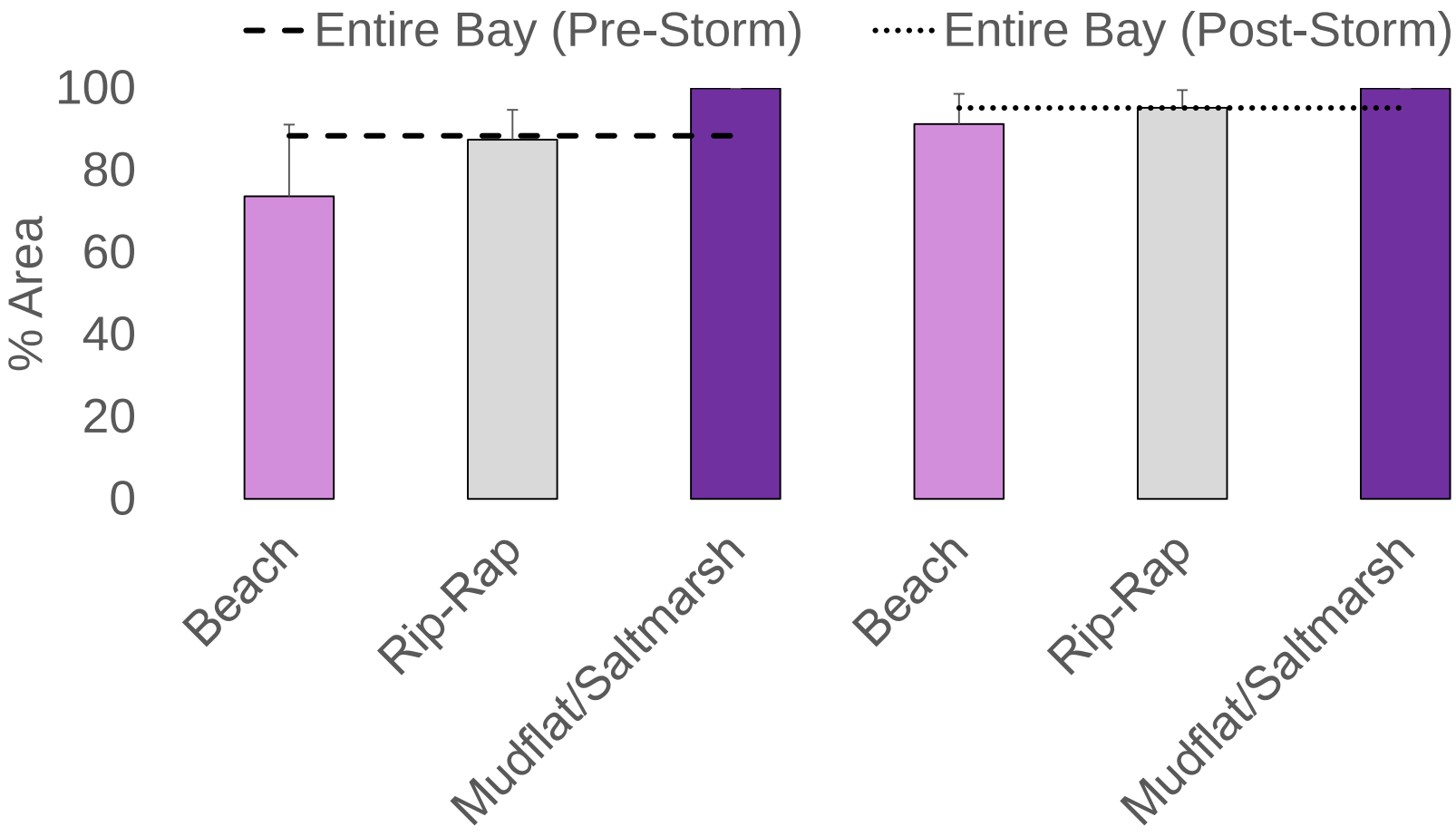
Study Locations



Conditions Monitoring (M1): Bay

Trash Characterization within the Bay

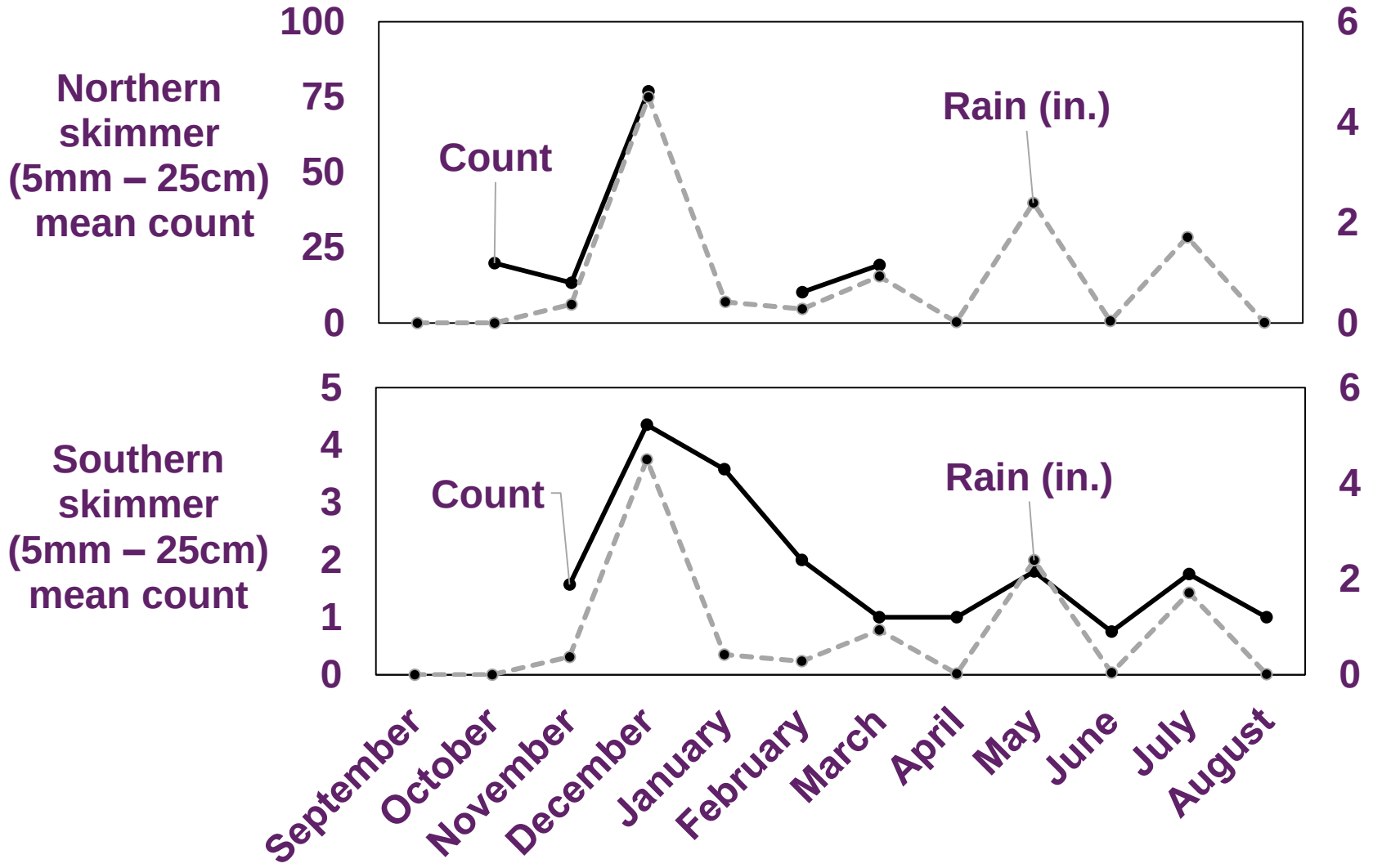
Percent Bay Area Covered by One or More Plastic Pieces



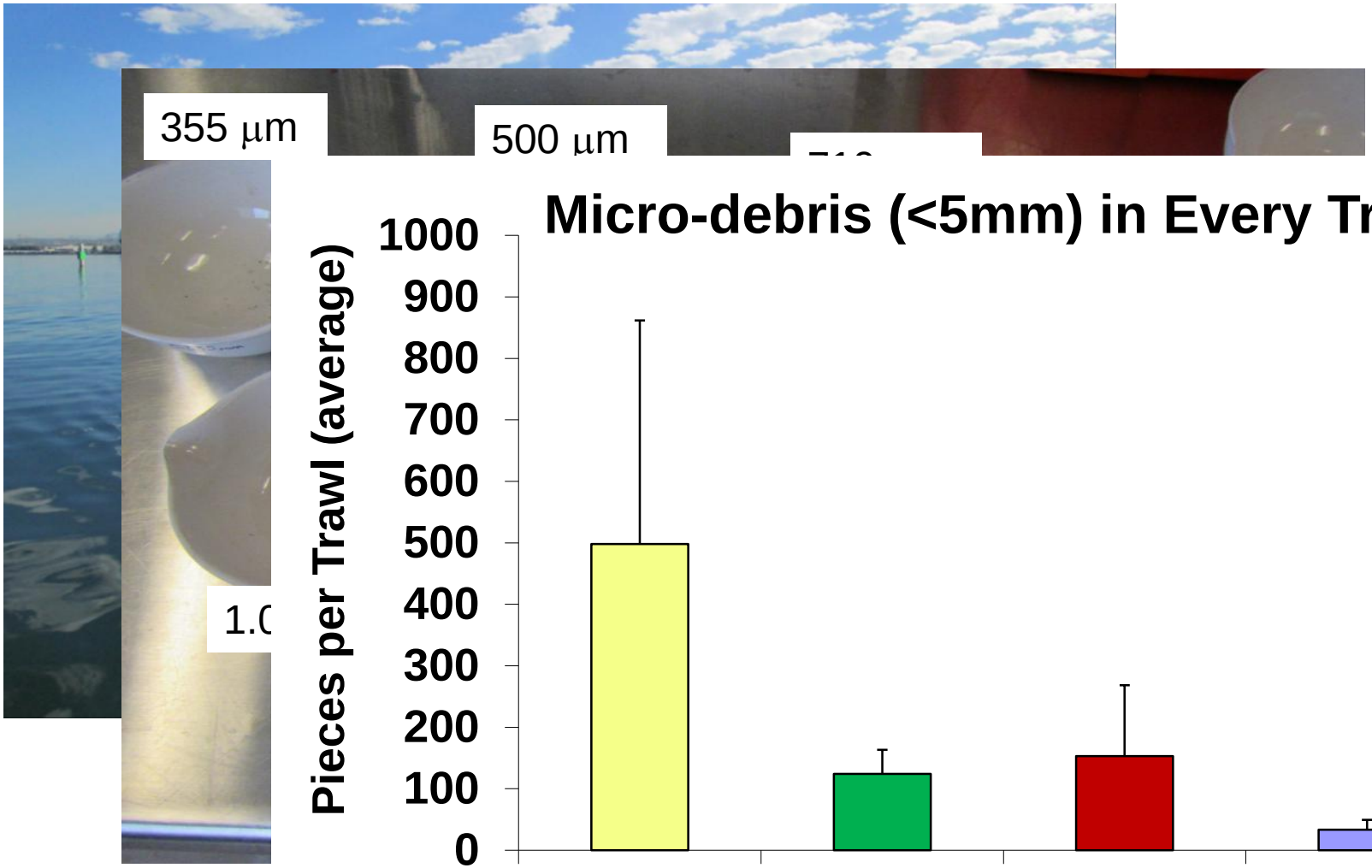
Trash Characterization along Intertidal

Highest debris amounts located along wrack line

Trash Characterization at Skimmers



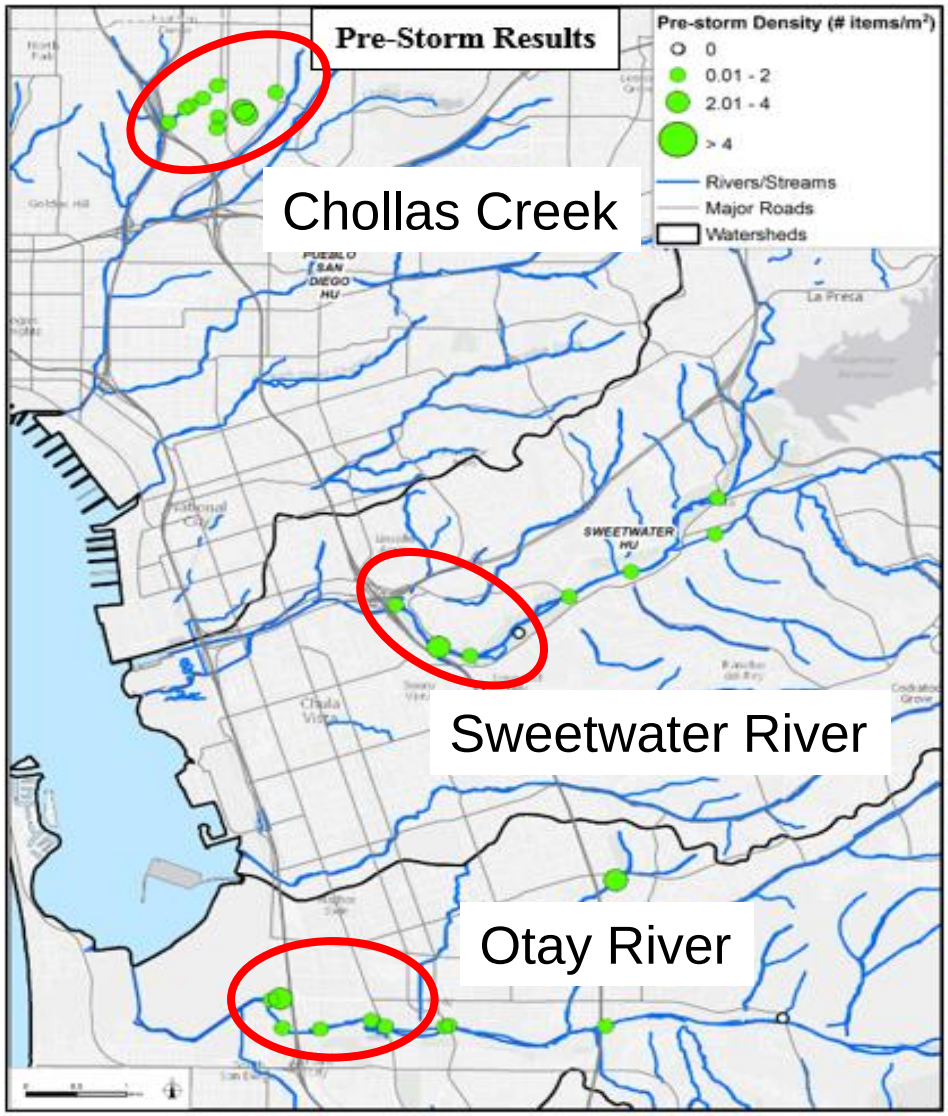
Trash Characterization on Open Water

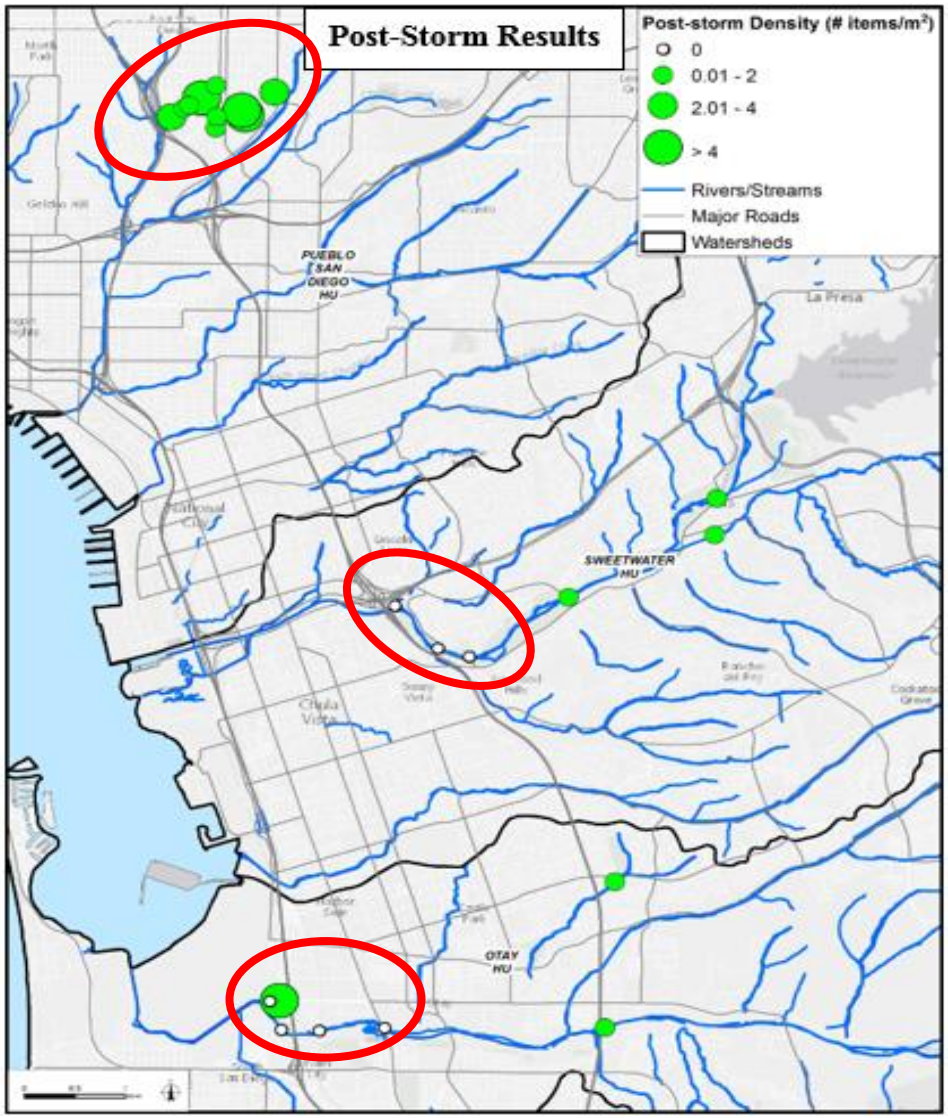


Condition Monitoring (M1): Riverine

Chollas Creek

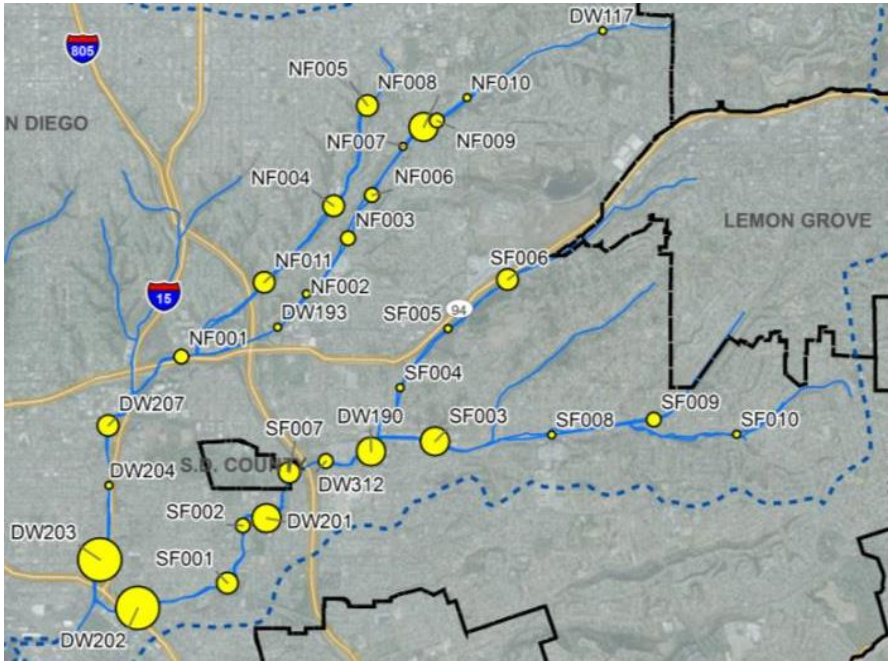
Trash characterization and hot spot identification



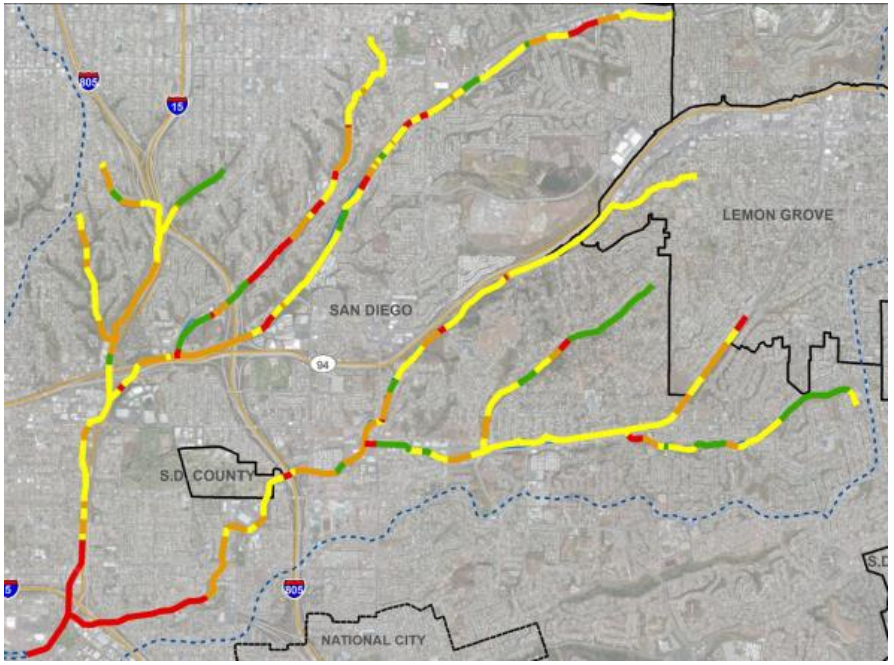


Trash Characterization in Chollas Creek

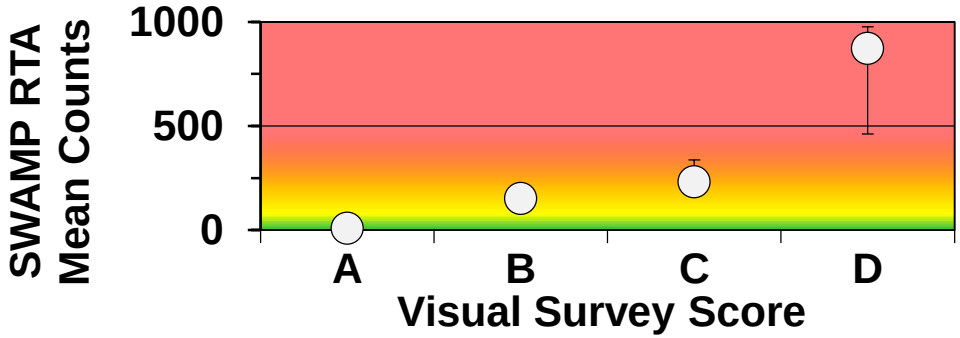
Quantitative Survey



Qualitative Survey

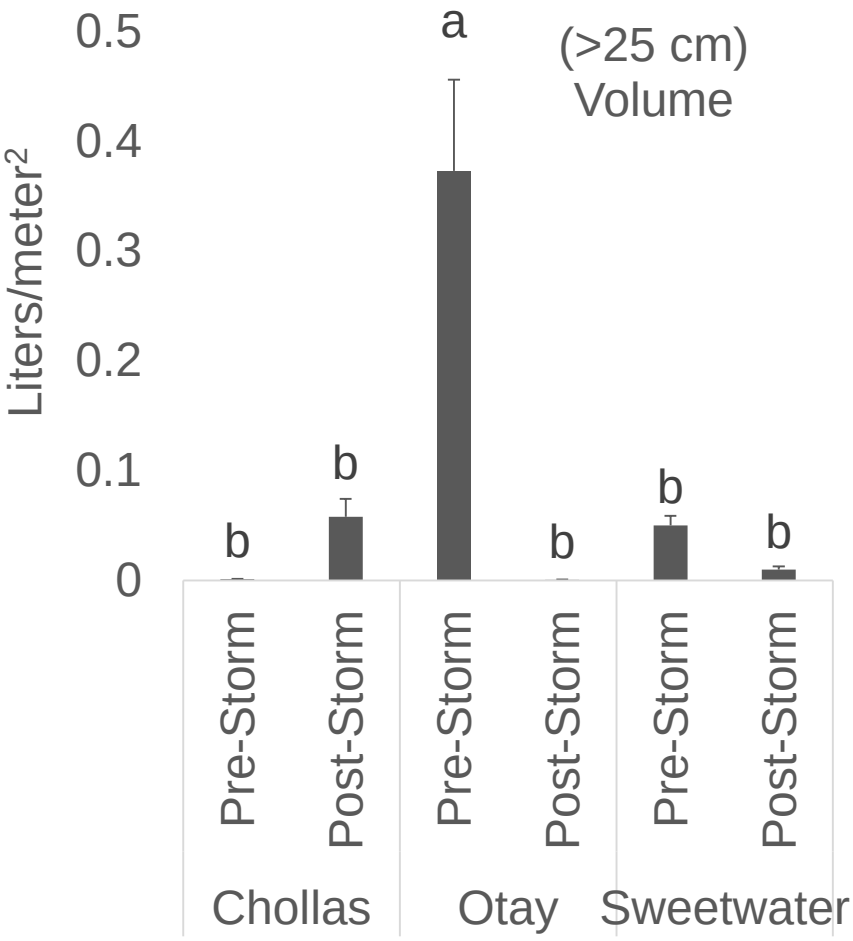


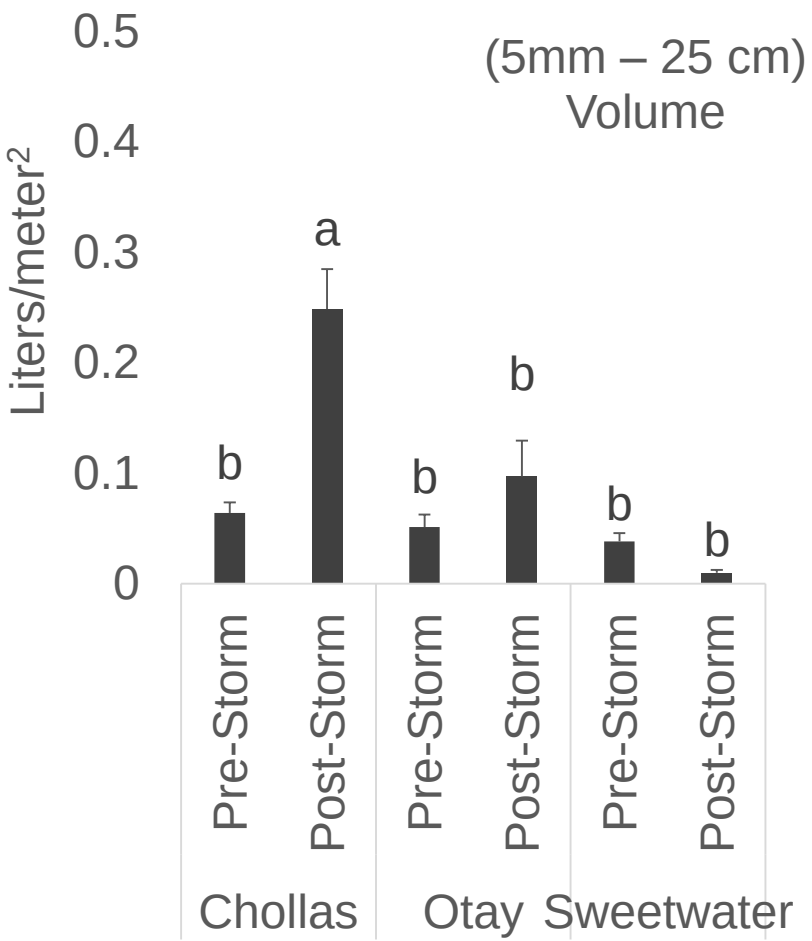
30 sites



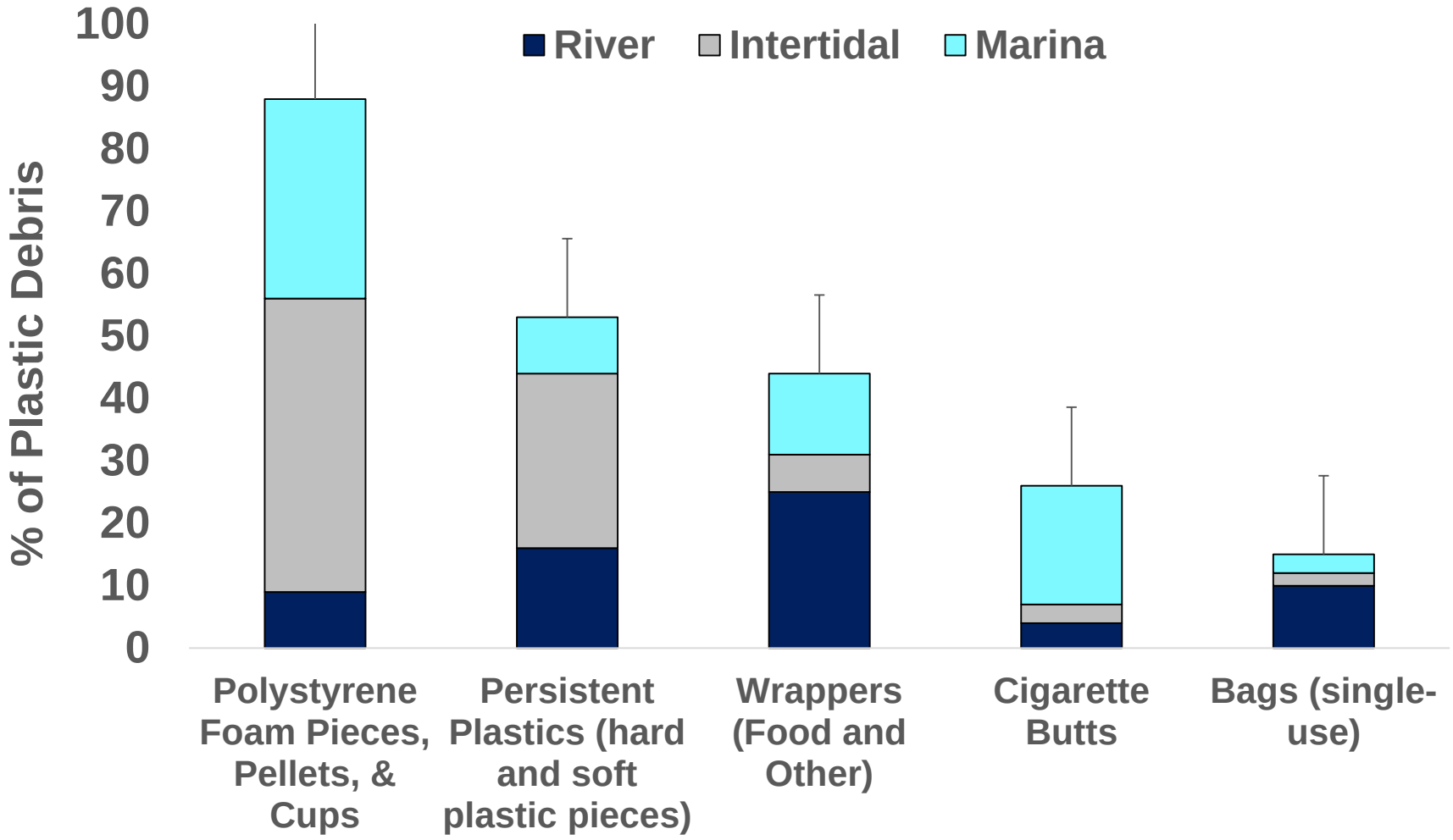
28 miles

Stressor Identification Monitoring (M2)





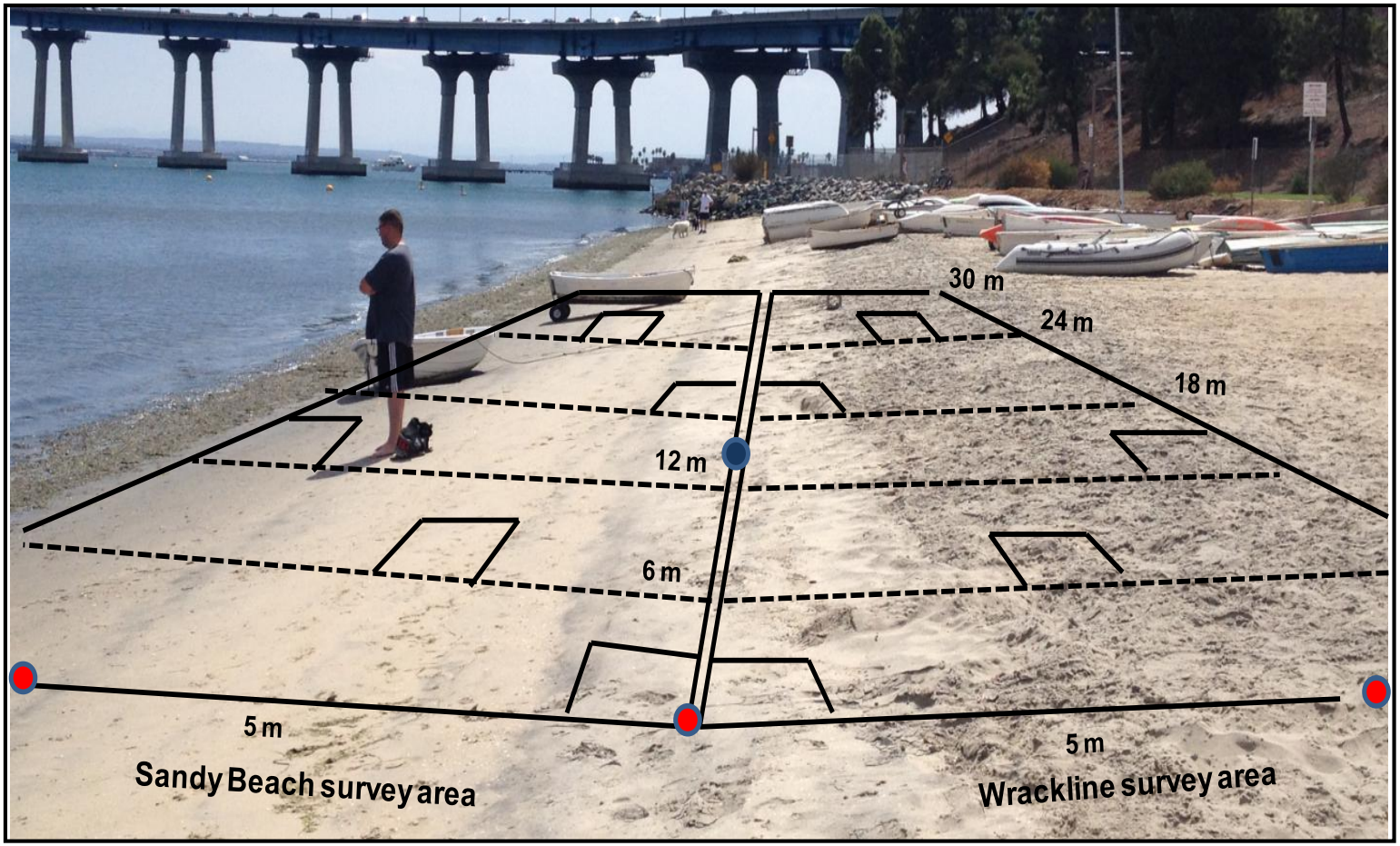
Stressor Identification Monitoring (M2)



Lessons Learned

Lesson Learned 1.

Need to manage complexities of current methods and design tiered approaches for different end users.



Lesson Learned 2.

Labor intensive methods makes surveys challenging and volunteers less likely to return

Lesson Learned 3.

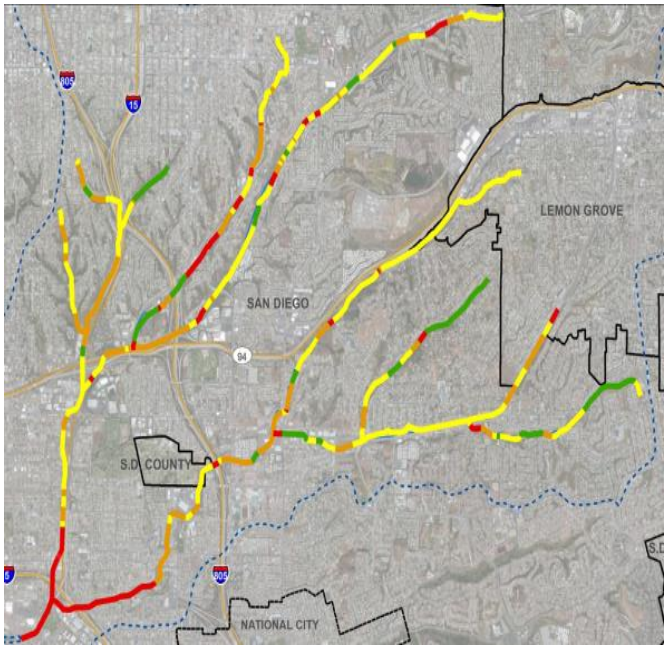
Rapid methods could improve representativeness and increase survey efficiency

Rapid Method (4x more)

Standard Method

Lesson Learned 4.

Qualitative survey improved assessments and increased management options



Green (Clean)
3.85 miles (14.1%)

Yellow (Few Pieces)
13.21 miles (48.5 %)

Orange (Small to Moderate)
6.75 miles (24.8 %)

Red (Moderate to High)
3.43 miles (12.6 %)


Illegal Dumping


Other Pathways

Lesson Learned 5.

Quantitative survey methods should be limited to countable key trash items

Degraded polystyrene pieces were often too numerous to count

Project Scientists

Ted Von Bitner, *Amec Foster Wheeler*

Terra Miller-Cassman, *Amec Foster Wheeler*

Dr. Theresa Talley, *California Sea Grant*

Travis Pritchard, *San Diego Coastkeeper*

Chad Loflen, *San Diego RWQCB*

Heather Krish, *City of San Diego*

Christiana Boerger, *US Navy*

Project Management, *SWAMP*

Dr. Betty Fetscher

Dr. Lilian Busse

Questions

Contact Information

Terra Miller-Cassman

Amec Foster Wheeler, Environment and Infrastructure

9177 Sky Park Court, San Diego CA, 92672

(858) 514-7753

terra.millercassman@amecfw.com